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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/020,460 | 12/18/2001 | Jun Ito | P 282612 T36-141808M/KOH | 9881 |
| 7590 | 06/15/2004 | | EXAMINER CRANE, SARA W | |
| SEAN M. MCGINN MCGINN & GIBB, PLLC 8321 OLD COURTHOUSE ROAD SUITE 200 VIENNA, VA 22182-3817 | | | ART UNIT 2811 | PAPER NUMBER |

DATE MAILED: 06/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/020,460

Applicant(s)

ITO ET AL.

Examiner

Sara W. Crane

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 April 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6, 8-11, 20 and 23-31 is/are pending in the application.
- 4a) Of the above claim(s) 8-11, 30 and 31 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 20, 23 and 25-29 is/are rejected.
- 7) ☒ Claim(s) 24 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

The Terminal Disclaimer submitted 19 April 2004 has been approved by the TC paralegal. The double patenting rejection in the Final Rejection of 17 December 2003 is therefore overcome. The finality of that Office action is withdrawn, and a new Final Rejection is entered below.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-3, 5-6, 20, 23, and 25-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP-A-0 865 088 (Motoki et al).

As noted by the European examiner in the NPL document submitted by Applicant on 16 July 2003, the claim language of claim 1, requiring an undercoat layer of metal nitride, reads on the prior art buffer layer of GaN, because Ga is itself a metal. See figure 2 of the Motoki reference, for example, which shows substrate 11, "undercoat layer" 12, and group III nitride compound semiconductor layer 13. Layer 13 is separated from the substrate 11 by layer 12. The claim is anticipated, hence obvious. Alternatively, it would have been obvious to one of ordinary skill in the art to provide an "undercoat layer" of GaN between a GaAs substrate and an overlying GaN layer, because the structure of such a device is the same as taught in the reference, and because undercoating as a method of forming a layer structure would mean forming layer 12 under layer 13, which would have been obvious in order to obtain layer 13 on top of layer 12.

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With respect to claim 2, layer 12 directly contacts layer 13. With respect to claim 3, layer 12 is only GaN. With respect to claim 5, layer 11 is GaAs. With respect to claim 6, the abstract teaches the crystal orientation claimed. With respect to claim 20, it would have been obvious to form a metal electrode as recited, in order to apply necessary voltages to a device as shown by the electrodes in figure 1 of the reference. (Note that nothing in the claim language prevents one from reading "substrate" on 1, 2 of Motoki figure 1, with 3 being and "undercoat layer" and 4, 5, 6, 7, being "a group III compound semiconductor layer.") With respect to claim 23, the crystallinity of the Motoki layers was "predetermined." With respect to claim 25, optimization of layer thickness would have been obvious in order to optimize known factors which depend on thickness, such as conductivity and mechanical stability. With respect to claim 26, as noted above a metal electrode would have been obvious. With respect to claim 27, the prior art of Motoki et al. teaches a light emitting device. With respect to claim 28, the prior art layer would inherently reflect at least some light emitted by an overlying layer. With respect to claim 29, the process step recited has not been shown to give rise to structure distinct from that of the reference.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Motoki et al. in view of Major et al.

Figure 12 of Major et al. teaches AlGa_{0.3}N layer 326, separating substrate 325 from overlying nitride semiconductor layers. AlGa_{0.3}N is a nitride of Al and Ga, and Al and Ga together would form a metal alloy, so AlGa_{0.3}N would be "a nitride of a metal alloy," as required by amended claim 4. So the Major reference alone

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would anticipate the structure of claim 4, and anticipation is the epitome of obviousness. Alternatively, it would have been obvious to use AlGa_N as a buffer layer instead of Ga_N in the Motoki structure, to allow for lattice matching of a range of materials in overlying epitaxial growth.

Allowable Subject Matter

Claim 24 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Applicant's amendment of 25 April 2003 overcame the art rejection of the previous Office action, and therefore necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will

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the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to S. Crane, whose telephone number is (571) 272-1652.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist, whose telephone number is (571) 272-1562.


Sara W. Crane
Primary Examiner
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